

IN THE CLAIMS:

This listing of the claim will replace all prior versions and listings of claim in the present application.

Listing of Claims

1. (previously presented) A router connected a core network, a first local area network (LAN) belonging to a first virtual private network (VPN), a second LAN belonging to a second VPN, a third LAN belonging to a third VPN and a fourth LAN belonging to a fourth VPN, comprising:

a memory;

a first interface for accommodating a first line connected to the first LAN and the second LAN, and for receiving multiplexed IP packets from the first and the second LANs via the first line, the IP packets from the first and the second LANs being encapsulated by a first protocol;

a second interface connected to the core network;

means for identifying which of the first VPN and the second VPN to which an IP packet received at the first interface belongs by header information of the first protocol; and

means for registering, in the memory, header information of the first protocol as a VPN identifier for identifying which of the first VPN and the second VPN to which an IP packet received from the first line belongs,

wherein IP packets from the third and the fourth LANs being encapsulated by a second protocol different from the first protocol.

2. (currently amended) A router according to claim 1, further comprising:

a first routing table for the first VPN, the first routing table mapping each IP addresses used in the first VPN to each of capsule headers used in the core network;

a second routing table for the second VPN, the second routing table mapping each IP addresses used in the second VPN to each of capsule headers used in the core network;; and

a processing unit for adding an capsule header used in the core network to an IP packet belonging to the first VPN by referring the first routing table.

3. (original) A router according to claim 1, wherein the first protocol is an asynchronous transfer mode protocol and the header information is expressed in combined VPI and VCI values; and

wherein the second protocol is a Point-to-point Protocol (PPP) over a Synchronous Optical Network (SONET).

4. (original) A method of setting up a router connected to a core network, a first local area network (LAN) belonging to a first virtual private network (VPN), a second LAN belonging to a second VPN, a third LAN belonging to a third VPN and a fourth LAN belonging to a fourth VPN, wherein the router receives multiplexed IP packets from the first and the second LANs via a first line, the IP packets from the first and the second LANs being encapsulated by a first protocol, receives IP packets from the third LAN via a second line and IP packets from the fourth LAN via a third line, the IP packets from the third and the fourth LANs being

encapsulated by a second protocol different from the first protocol and has a memory, the method comprising the steps of:

registering header information of the first protocol as a VPN identifier for identifying which of the first VPN and the second VPN to which an IP packet received from the first line belongs to the memory;

registering physical interface numbers assigned to interface between the router and the second line and interface between the router and the third line as a VPN identifier for identifying which of the third VPN and the forth VPN to which an IP packet received either the second line or the third line belongs.

5. (currently amended) A method of setting up a router according to claim 4, further comprising the step registering to the memory:

a first routing table for the first VPN, the first routing table mapping each IP addresses used in the first VPN to each of capsule headers used in the core network, each of the capsule headers is adding to an IP packet from the first line having the corresponding IP address;

a second routing table for the second VPN, the second routing table mapping each IP addresses used in the second VPN to each of capsule headers used in the core network, each of the capsule headers is adding to an IP packet from the first line having the corresponding IP address;

a third routing table for the third VPN, the third routing table mapping each IP addresses used in the third VPN to each of capsule headers used in the core network, each of the capsule headers is adding to an IP packet from the second line having the corresponding IP address;

a fourth routing table for the fourth VPN, the fourth routing table mapping each IP addresses used in the fourth VPN to each of capsule headers used in the core network, each of the capsule headers is adding to an IP packet from the third line having the corresponding IP address.

6. (original) A method of setting up a router according to claim 4, wherein the first protocol is an asynchronous transfer mode protocol and the header information is expressed in combined VPI and VCI; and

wherein the second protocol is a Point-to-point Protocol (PPP) over a Synchronous Optical Network (SONET).

7. (previously presented) A method of setting up a router connected to a core network, a first local area network (LAN) belonging to a first virtual private network (VPN), a second LAN belonging to a second VPN, a third LAN belonging to a third VPN and a fourth LAN belonging to a fourth VPN, wherein the router receives multiplexed IP packets from the first and the second LANs via a first line, the IP packets from the first and the second LANs being encapsulated by a first protocol, the IP packets from the third and the fourth LANs being encapsulated by a second protocol different from the first protocol and has a memory, the method comprising the step of:

registering, in the memory, header information of the first protocol as a VPN identifier for identifying which of the first VPN and the second VPN to which an IP packet received from the first line belongs.

8. (previously presented) A method of setting up a router according to claim 7, further comprising the steps of:

registering, to the memory, a first routing table for the first VPN, the first routing table mapping each IP addresses used in the first VPN to each of capsule headers used in the core network, each of the capsule headers is adding to an IP packet from the first line having the corresponding IP address; and

registering, to the memory, a second routing table for the second VPN, the second routing table mapping each IP addresses used in the second VPN to each of capsule headers used in the core network, each of the capsule headers is adding to an IP packet from the first line having the corresponding IP address.

9. (previously presented) A method of setting up a router according to claim 7, wherein the first protocol is an Asynchronous Transfer Mode (ATM) protocol and the header information is expressed in combined VPI and VCI; and

wherein the second protocol is a Point-to-point Protocol (PPP) over a Synchronous Optical Network (SONET).

10. (previously presented) A router connected to a core network, a first Local Area Network (LAN) belonging to a first Virtual Private Network (VPN), a second LAN belonging to a second VPN, a third LAN belonging to a third VPN, and a fourth LAN belonging to a fourth VPN, comprising:

means for receiving IP packets from the first and the second LANs being encapsulated by a first protocol;

a first interface connected to the core network;

a second interface for accommodating a first line connected to the third LAN and a second line connected to the fourth LAN, and for receiving IP packets from the third LAN via the first line and the IP packets from the fourth LAN via the second line, the IP packets from the third and the fourth LANs being encapsulated by a second protocol different from the first protocol;

means for identifying which of the third VPN and the fourth VPN to which an IP packet received at the second interface belongs by physical interface numbers assigned to interface between the second interface and the first line and interface between the second interface and the second line; and

means for registering physical interface numbers assigned to interface between the second interface and the first line and interface between the second interface and the second line as a VPN identifier for identifying which of the third VPN and the fourth VPN to which an IP packet received either the first line or the second line belongs.

11. (previously presented) A router according to claim 10, further comprising:

a first routing table for the third VPN, the first routing table mapping each IP addresses used in the third VPN to each of capsule headers used in the core network;

a second routing table for the fourth VPN, the second routing table mapping each IP addresses used in the fourth VPN to each of capsule headers used in the core network; and

a processing unit for adding a capsule header used in the core network to an IP packet belonging to the third VPN by referring the first routing table and adding a capsule header used in the core network to an IP packet belonging to the fourth VPN by referring the second routing table.

12. (previously presented) A router according to claim 10, wherein the first protocol is an Asynchronous Transfer Mode (ATM) protocol and the header information is expressed in combined VPI and VCI values, and

wherein the second protocol is a Point-to-point Protocol (PPP) over a Synchronous Optical Network (SONET).

13. (previously presented) A method of setting up a router connected to a core network, a first Local Area Network (LAN) belonging to a first Virtual Private Network (VPN), a second LAN belonging to a second VPN, a third LAN belonging to a third VPN and a fourth LAN belonging to a fourth VPN, said router having a memory, said method comprising the steps of:

receiving IP packets from the first and the second LANs being encapsulated by a first protocol, and receiving IP packets from the third LAN via a first line and IP packets from the fourth LAN via a second line, the IP packets from the third and the fourth LANs being encapsulated by a second protocol different from the first protocol; and

registering physical interface numbers assigned to interface between the router and the first line and interface between the router and the second line as a

VPN identifier for identifying which of the third VPN and the fourth VPN to which an IP packet received either the first line or the second line belongs.

14. (previously presented) A method of setting up a router according to claim 13, further comprising the steps:

registering, to the memory, a first routing table for the third VPN, the third routing table mapping each IP addresses used in the third VPN to each of capsule headers used in the core network, each of the capsule header is adding to an IP packet from the first lien having the corresponding IP address; and

registering, to the memory, a second routing table for the fourth VPN, the second routing table mapping each IP addresses used in the fourth VPN to each of capsule header sued in the core network, each of the capsule headers is adding to an IP packet from the second line having the corresponding IP address.

15. (previously presented) A method of setting up a router according to claim 13, wherein the first protocol is an ATM protocol and the header information is expressed in combined VPI and VCI; and

wherein the second protocol is a Point-to-point Protocol (PPP) over a Synchronous Optical Network (SONET).